NURTURES Evaluation Report: Year 1

Completed by:

Acumen Research and Evaluation, LLC

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On the behalf of:

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This report summarizes the activities and finding of the evaluators of the NSF MSP project at The University of Toledo entitled NURTURES from July 2011 through March 2012.

I.   Executive Summary

This report examines the Planning Phase (Phase I) of the NURTURES project. The project focus is to develop a complementary science learning environment for grades pre-K -3. There are three phases to this project: Planning Phase (Year 1), Demonstration/Training Phase (Year 2), and Implementation Phase (Years 3-5). This report examines the Planning Phase. Evaluation of the Planning Phase consisted of comparing project outcome attainment with proposal timeline and observing and reviewing the Planning Team's group process procedures and outcomes. Data were collected through review of project documents such as hiring paperwork, direct observation of the retreat, examination of Summer Institutes, personal interviews with members of Planning Team, and examination of recruiting materials and efforts.

Project documentation showed attainment of all Year 1 outcomes within a timely manner. All employees have been hired and trained (Master Teachers are still in training but that is within the timeframe). A detailed timeline of activities for this summer and Year 2 has been developed.

Evaluators made direct observations of several of the planning team's weekly meetings. Tangible outcomes, group progress, and group dynamics were examined. To date, the team has achieved the tangible outcomes expected at this point. Interactions between members continually improved over the course of the year as group members became more familiar with one another. As far as group dynamics, the group works as a cohesive entity towards mutual goals.

The evaluators conducted personal interviews with members of the planning team to further examine the group process—particularly from each member's perspective. Again, strong evidence of mutual respect and an atmosphere conducive to positive interaction and progress was provided. While a few felt the meetings to be a bit long, all appreciated that they were well-organized and little time was wasted. Most members of the team identified more closely with their own specific role within the project as opposed to identifying with the project as a whole.

Master Teachers were recruited and hired. While the goal was to recruit teachers from the Toledo Review and Alternative Compensation System (TRACS) within the Toledo Public Schools, only two of the Master Teachers are TRACS teachers. However, the group represents teachers from grades pre-K through 3 with experience teaching science and coaching or providing other teachers with professional development.

The evaluators have developed interview protocols for Master Teachers to be used during the Summer Institute, have worked with content faculty in the development of pretest/posttest instruments to measure content gain, and have developed a Teacher Inquiry Behavior Protocol and Parent Science Activity Survey to be piloted in Master Teacher classrooms during Year 2.

Overall, Phase I concludes having met its objectives. The groundwork for a successful MSP has been laid and will be piloted during Year 2.

II.   Introduction

The evaluation plan for the project was created by Acumen Research and Evaluation, LLC to determine the impact of NURTURES on children's interest in and curiosity about science. The NURTURES grant evaluation logic model includes three phases of the evaluation plan matched to the three phases of the project: planning, training, and implementation. The grant is currently in year 1 and Phase 1 (Year 1 ends June 30, 2012). Evaluation of the Planning Phase consisted of observing and reviewing the Planning Team's group process procedures and outcomes. Data were collected through direct observation of the retreat, examination of Summer Institutes, personal interviews with members of Planning Team, and examination of recruiting materials and efforts. In addition, the evaluators determined existing instruments suitable for measuring Phase 2 (Training/Demonstration Phase) of the project and developed instruments when appropriate measures did not exist.

A. Planning Phase Evaluation Model

The Planning Phase Evaluation Model was designed to map out the assessment of the grant activities as it pertains to the goals and outcomes of the first year of the project (Table 1). During Year 1, the Planning Phase, the evaluation team had five major responsibilities—(1) observe the planning process and resulting group dynamics of the Planning Team, (2) review schedules for Summer Institute and Demonstration Phase, (3) interview Planning Team members, (4) observe the planning retreat, and (5) review recruiting materials for the Master Teacher positions. Not listed in the model but of equal importance was the compilation and development of assessments to use during Phase 2. To date, the evaluators have completed observations of the planning process, interviewed the planning team, examined recruiting materials for the Master Teachers, and compiled existing and developed assessments for Year 2. Observation of the Retreat and review of the Summer Institute schedule will occur in May/June 2012 and reported in Year 2 Annual Report.

III.   Observations of the Planning Process

A member of the evaluation team frequently attended planning meetings during the past year. The purpose was not to provide input but rather to observe the group dynamics and planning process. A teamwork protocol was used to ascertain the level of collaboration and teamwork that is present within the group (Schultz, Israel, and Lance, 2002). Several themes emerged from the meetings: Tangible outcomes, group progression, and group dynamics.

A. Tangible outcomes

The planning team, project staff, and graduate assistants have been developing a framework for the 2012 Summer Institute. The framework will be used to educate Master Teachers as to how to teach their peers science inquiry based strategies in the classroom (in preparation for Summer Institute 2013). To assist with the creation of the tool, graduate students have been researching and structuring how science inquiry content is currently being taught in the classroom. Other strategies are being utilized to aid with the development of lesson content. Reverse engineering is a well-known engineering strategy that is being used to develop what the Summer Institute content will be for 2013. The group has been working towards the creation of example lessons to illustrate and better understand how adults learn. In addition to researching

Table 1: NURTURES Planning Phase Evaluation Model

Planning Phase—The foundation for all outcomes and overall project goal			
Method	**Variable Measured**	**Purpose**	**Progress to date**
Observation of planning process	Group process and achievement of stated outcomes	To determine whether the Planning Team is working together towards project goals	Completed
Observation of retreat	Group dynamics	To determine whether format is conducive to collaboration	Will be completed in June 2012
Interview with planning team members	Participants' perception of success of retreat	To determine degree to which teamwork goals are being met	Completed
Review of Summer institute schedule	Planning for summer completed	To determine whether summer program is thoroughly planned	Will be completed by June 2012
Examination of recruiting materials and strategies	Planning for recruitment completed	To determine whether project is prepared for recruitment	Completed

teacher behavior development (with regards to adult learning), the group has been addressing other aspects of the grant such as what exemplar informal activities should be included for the parents and children.

In addition to science content, the pedagogy methods and literacy strategies that will be implemented into the new science content have been discussed. The group has decided to develop a month long training session to develop inquiry based science content in science lessons. The team has also been researching ways in which children think and ways to chart what inquiry behaviors need to occur to illustrate learning is occurring.

A smaller group within the group has been developing a coding system for teacher science inquiry behaviors. To ensure that the tool is inclusive, both early childhood and engineering graduate students are developing the behavior codes for the assessment.

B. **Group Progression**

Over the past year, the planning team has been meeting weekly. The group has been able to brainstorm and share ideas freely. Initially, the group spent quite a bit of time determining the types of behaviors good science teachers exhibit when teaching science. During the second half of the year, specific tasks were assigned to some members and smaller groups were formed. With the groundwork for the first Summer Institute well underway, sights have turned to the examination the new national science standards to determine what science learning consists of as well as the hallmarks of a Master Teacher.

C. **Group Dynamics**

The group worked cohesively and group members were comfortable sharing perspectives and eliciting feedback. While members of the group did not always agree, opposing perspectives were presented cordially and no one member of the group dominated the conversation. Also,

team leaders were able to successfully guide their workgroups independent of the larger group. The weekly meetings were conducive to removing barriers as they allowed group members to work through their problems and, when problems did occur, group members were able to redirect behavior to achieve desired outcomes. The diversity of disciplines provided a rich foundation for group members to voice their opinions and work together.

IV. Interviews with Planning Team

In March 2012 the evaluators conducted personal interviews with members of the Leadership team to examine group processes—to assess the level of teamwork and collaboration present within the team. The Leadership team is comprised of six members including the PI, the co-PIs, and some senior personnel. The interviews consisted of questions concerning their main role on the project, group process, satisfaction with progress, and content development. Each question asked is provided below along with a summary of the responses of the six interviewees.

A. Interview Responses

1. First tell me what you been doing for the NURTURES project over the past year?

The majority of the team described personal responsibilities concerning the project such as providing advice, acting as a resource, developing a coding scheme, and hiring and training personnel. Only two of the members provided a rich description of the group work as a whole and the progress that has been made. The difference is in the interpretation of the word "you". The majority of respondents interpreted "you" to mean themselves and the other two identified with the group to the extent that "you" has taken on the collective definition of "your group" or "you all".

2. With whom do you work with to plan?

Four of the six mentioned the entire planning team. Two indicated specific people—one mentioned a member of the staff and the other worked mostly with graduate assistants.

3. How well does the group work together?

They all agreed that the group works well together and a few noted that the membership consists of some very different backgrounds. In fact, several were surprised at how well the members of the group get along. Only one respondent provided examples of their harmony. This respondent felt comfortable speaking up when unsure and indicated that no matter how little a group member knew about a subject, he or she could express an opinion and the group respected it.

4. When problems arise, how well does the group work together to solve them? Can you provide a specific example?

The definition of a "problem" seemed to vary among the respondents. In most cases, a problem was equated with either a misunderstanding (a member not understanding what someone else is trying to say) or a disagreement among members of the group. Responses to this item were vague. Most said that disagreements were discussed and resolved. One member felt that the group had not experienced any problems to date. Only one member was willing to provide an example of a problem and indicated that the objection one member had to a situation was not relevant to their discussion.

5. What are the major issues you are involved in?

All but one member had a clear idea of what they contribute to the group and which responsibilities and to which issues they contribute. One member from the five who had a clear idea felt that only recently has that contribution been realized and is now happy to have a place within the group.

6. *How would you describe the rate of progress in which the group is making in dealing with major issues identified?*

Three of the respondents felt progress to be satisfactory and one of the three mentioned the value of taking their time at the beginning to set the groundwork. Two others felt progress during the first six months to be slow but are now satisfied with the speed at which the group is moving towards meeting its timetable. These two did not, however, object openly to their perceived slow rate of progress during the early months of the project. One respondent did not answer this question.

7. *Where is your group as far as achieving its goals?*

Three members provided specific goals achieved that related to their role in the project. Two indicated progress towards project level goals and one was not sure "what the current goals are." While the remaining five felt progress to be satisfactory, only the two who identified project goals, responded to the question accurately (your group rather than you).

8. *How does the group work through times when they are bogged down?*

One respondent was not aware of any roadblocks. The other five agreed that when the group gets stymied they either table the topic till a future meeting or try to work through it. One member felt that early on the group was not cohesive enough to work through rough spots but now it is at a place where there is mutual respect in spite of the fact that the group has grown in size.

9. *What were your initial expectations of the planning meetings?*

Only the PI had a clear idea as to what the planning meetings would be like. Others either had no expectations, vague expectations or a very different idea of what was to occur.

10. *Have your initial expectations changed?*

Not surprisingly, all but the PI has changed his/her view of the meeting expectations. Of course those who had not made any assumptions about the meeting now have a clear understanding of their function within the project. Those with vague ideas have a more precise understanding and one member was surprised that the meetings were as democratic as they are and that everyone seems to have input as to the direction the meetings take.

11. *Can you tell me effective attributes that form the planning meetings?*

The respondents mentioned several positive attributes. Most frequently they noted the diverse group, mutual respect, and the open atmosphere. Also mentioned was that the meetings were well organized. One member felt the meetings run too long.

12. *What do you think the end results of the planning meetings will be?*

All felt the Planning Phase will end with a strong Summer Institute design. One member felt that the Planning Phase will not be completed at the end of the first year but will continue into the Pilot Phase.

13. Do you know what to do next and are you comfortable with carrying these responsibilities?

Five of the six articulated future responsibilities and felt comfortable with their responsibilities for the summer and Year 2. One was not sure of what was expected of him/her.

B. Summary of Interviews:

Responses from the six members of the planning team indicated mutual respect and an atmosphere conducive to positive interaction and progress. While some felt the initial meetings to be drawn out, all agreed that recently they have been more productive and most (5) have a clear vision of their role in the project for Phase II. All felt the meetings have been well organized and appreciated the time taken to review agendas and provide background materials in advance. While all members see themselves as a contributing piece to the project, most do not associate themselves with the planning group as such. In other words, when answering questions, the majority of comments centered upon the individual (I will/have done this) as opposed to work the group as a whole has accomplished. Only two of the members spoke from the perspective of the group rather than their individual contribution and experience.

V.   Master Teacher Recruiting Materials and Results

Prior to recruiting Master Teachers, the NURTURES planning team held a meeting in which the expectations and commitments of the Master Teacher position were detailed. Based upon previous experience with Toledo Public Schools, it was determined that recruitment efforts would focus on selecting teachers who are in the Toledo Review and Alternative Compensation System (TRACS). The goal of TRACS is to promote teacher quality while improving student academic performance. TRACS focuses on ongoing teacher professional development that targets specific student academic and school improvement needs including effective teaching and learning and the retention of the most accomplished teachers through acknowledging and rewarding teaching excellence. TRACS maximizes the talents of recognized teacher leaders by assigning additional assignments or leadership roles and/or by placing them in high needs schools or in challenging teaching assignments. If the project was unable to recruit teachers from TRACS, then STEM teachers with strong recommendations from principals and/or other school leadership would be considered.

The interview questions for Master Teacher were intended to identify the underlying philosophy of the potential Master Teachers. The interview team consisted of the PI/co-PI's and project staff. Questions focused on the interviewee's ideology as it relates to his/her teaching philosophy. Other questions focused on teaching practices. For example, "Describe the best science lesson you ever taught;   what are some ways you integrate STEM into your everyday curriculum?" The questions were designed to probe for information about the teacher's flexibility in dealing with the constant changes that occur in the classroom when teaching using inquiry-based strategies. To date, all six of the Master Teachers have been selected. They represent preschool through grade 3 and range in years of teaching from 6 to 29 with an average of 16.5 years. While only two are TRACS teachers, a third has been a science support teacher in

Toledo Public Schools for several years. The two TRACS teachers, both teachers of first grade, have served as a Peer Math Coach and a Peer Literacy Coach for their district.

VI. Training Phase Assessment Tools

The original evaluation plan called for the use of the Science Teacher Self Efficacy Instrument (STEBI) (Riggs and Enochs, 1990) the Science Teacher Ideological Preference Scale (STIPS) (Jones and Harty, 1978; Gado, 2005), focus group interviews, content assessments, and classroom observations. In addition, a leadership survey used in the NSF MSP LEADERS will be adapted to assess Master Teacher leadership skills development and growth. Data will be collected from Master Teachers during Year 2 to establish a baseline to measure Master Teacher growth over time. Rather than implementing the Horizon Inside the Classroom Observation Protocol, a classroom observation rubric that examines teacher inquiry behaviors has been developed and will be discussed with advisor Shymansky when he visits the project this summer. The Teacher Inquiry Behavior Protocol was devised to assess the level of science inquiry in teaching behaviors. The protocol rates teachers on each of the following: questioning, defining problems, engagement in evidence-based discourse, and developing and using STEM concepts. The decision to change the observation tool was based upon a desire to more closely match the instrument with the intentions of the project. It will be piloted in the Master Teacher classrooms during Year 2 to establish evidence of reliability and validity.

Another tool developed this year and piloted next year is the Parent Science Activity Survey. This instrument is designed to examine parents' opinions of change in science interest in their children as well as their own proclivity towards helping their child learn more about science.

VII. Conclusions

In summary, the Planning Phase has met its stated objectives. Personnel have been hired; detailed planning for the first Summer Institute is well on its way; and members of the project team work together towards a common goal. Substantial groundwork has been laid for Phase II of the project and project personnel appear eager to enter into this next phase.

VIII. References

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